FAST STARLET®
DUAL SPEED HUB/24

User's Guide

Farallon®

Copyright © 1999 Farallon Communications, Inc. v.499
All rights reserved.

This manual and any associated artwork, software, and product designs are copyrighted with all rights reserved. Under the copyright laws this manual, artwork, software, and product designs may not be copied, in whole or part, without the written consent of Farallon. Under the law, copying includes translation to another language or format.

Farallon Communications, Inc.
3089 Teagarden Street
San Leandro, CA 94577-5720
U.S.A.

For additional copies of this user’s guide, order Farallon part number 6120352-00-01.

CONTENTS

Chapter 1 — Introduction 5
About the Fast Starlet® Dual Speed Hub.......................5
LEDs and ports 7

Chapter 2 — Installation..11
Choosing the location for your hub.............................12
Connecting power to your hub 14
Connecting the numbered ports 15
Uplinking to other hubs...17

Chapter 3 — Network Planning 19
10Base-T Ethernet guidelines....................................20
100Base-TX Fast Ethernet guidelines..........................22
Dr. Farallon can help your network 24

Appendix A — Technical Specifications 25

Appendix B — Cabling Information 27

Farallon Technical Support..31

Warranty

CHAPTER 1

Introduction

ABOUT THE FAST STARLET® DUAL SPEED HUB

The Fast Starlet Dual Speed Hub is a 10/100Mbps Ethernet/Fast Ethernet repeater that functions as two hubs in one, making it easy to integrate 10Base-T and 100Base-TX networks efficiently and reliably.

The Fast Starlet Dual Speed Hub is simple to install, features LEDs for troubleshooting, and includes an Uplink port for connecting to another Ethernet or Fast Ethernet hub. It also includes an internal 10/100 switch that connects your 10Mbps devices to your 100Mbps devices. The switch filters traffic that is not intended for devices running at a different speed. Like all Farallon Ethernet and Fast Ethernet products, the Fast Starlet Dual Speed Hub is fully compliant with IEEE 802.3 Ethernet and 802.3u Fast Ethernet standards.

FEATURES

The Fast Starlet Dual Speed Hub is a 24-port self-contained unit that can be quickly and easily installed in your office or lab. This hub requires no management software, and no user action, once it is installed. Flexible and robust, the Fast Starlet hub provides the ideal solution for your integrated 10Base-T/100Base-TX LAN environment.

All of the ports may be connected using unshielded twisted-pair (UTP) cable with RJ-45 connectors. The numbered ports are for connecting workstations, servers, or printers, and the Uplink port is for connecting another hub. The Uplink port has crossed-over wiring, eliminating the need for a crossover cable.

The Fast Starlet Dual Speed Hub includes the following features:

- Full compliance with IEEE802.3 Ethernet and IEEE802.3u Fast Ethernet standards
- 24 auto-sensing 10/100 ports
- 1 uplink 10/100 port for connecting to another hub
- Power, collision, link/activity, and 100TX LEDs
- Automatic partitioning of faulty ports
- Internal switch that interconnects 10Mbps and 100Mbps devices and reduces collisions
- 19-inch rack design (rack-mounting hardware included)
- Internal power that supports universal input voltage

PACKAGE CONTENTS

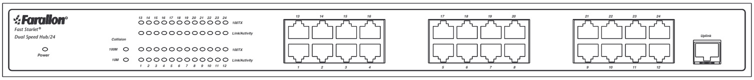
The Fast Starlet Dual Speed Hub/24 package includes:

- Fast Starlet Dual Speed Hub/24 hub
- Power cable*
- Self-adhesive feet (some models)
- Rack-mounting brackets and screws
- This user's guide

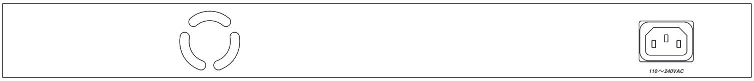
*Provided separately outside of North America.

LEDS AND PORTS

This section describes the functionality of all the features of your Fast Starlet Dual Speed Hub. Your hub has all of the status indicators (LEDs) and the 10/100Mbps ports on the front panel. The power port is located on the rear panel.



Fast Starlet Dual Speed Hub front panel



Fast Starlet Dual Speed Hub rear panel

LEDS

POWER LED

The green power indicator is on when the hub is receiving power. If the LED is off, check the following to isolate the problem:

- Make sure that the power cord is properly connected to the hub and securely plugged into the power outlet.
- Determine whether the outlet is functional by testing another device.

COLLISION LEDS

The two yellow collision indicators blink to indicate collisions on the network. One LED is for your 100Mbps segment and one is for your 10Mbps segment. A collision occurs when two or more stations in the same Ethernet collision domain try to transmit data at the same time. When this happens, all of the stations involved will recognize the collision, wait a random amount of time, and retransmit.

Collisions are a normal occurrence, but excessive collisions may indicate that your network is overly congested. Other network problems that can cause excessive collisions include:

- The cable length between the hub and the workstation exceeds 100 meters (330 feet).
- The total network diameter exceeds 205 meters (672.5 feet).
- There are faulty adapters or other equipment on the network.

100TX LEDS

Each port has a green link indicator that is lit whenever a 100Base-TX device is detected at the other end of the cable connected to that port.

LINK/ACTIVITY LEDS

Each port has a green link indicator that is lit whenever a 100Base-TX or 10Base-T device is detected at the other end of the cable connected to that port. The LED blinks to indicate that the port is receiving data.

These LEDs also indicate partitioned ports. If the hub partitions a port, it will turn off the link LED for that port even though the cable is still physically connected. To clear a partition, just reset the hub by recycling the power (disconnect the power cord from the hub and then plug it back in).

PORTS

NUMBERED 10/100MBPS PORTS

Each port supports a connection to either a 10Base-T or 100Base-TX device, such as a workstation, server, or printer. The ports may be connected using standard straight-through UTP cable.

UPLINK PORT

This port is designed to cross the send and receive signals and is used for connecting to another hub. Connect the Uplink port to a regular 10Base-T or 100Base-TX port on another hub with straight-through UTP cable.

Note: The Uplink port and port 12 cannot be used at the same time. When the Uplink port is connected, port 12 is disabled. LED 12 applies to port 12 or to the Uplink port, whichever is in use.

POWER PORT

The power port accepts the connector from the power cable.

Note that network segments may be connected and disconnected while your hub is receiving power. Plugging in and removing network cables will not interrupt the operation of the hub. If you are making changes to your network topology, however, you may need to reset the hub by recycling the power (disconnect the power cable from the hub and then plug it back in).

CHAPTER 2

Installation

Your Fast Starlet Dual Speed Hub is a “plug-and-play” device and can be installed quickly and easily. For best results, perform the following installation procedures in the order listed below.

1. Review the networking guidelines in Chapter 3.
2. Choose a proper location for your hub.
3. Connect power to your hub.
4. Connect computers, printers, and other devices to the numbered ports.
5. Connect the Uplink port (optional).

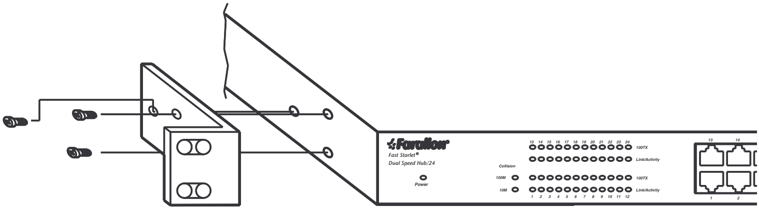
CHOOSING THE LOCATION FOR YOUR HUB

The Fast Starlet Dual Speed Hub may be installed in a variety of locations. You may mount the hub in a rack or create a desktop installation. Whether you stack or mount your hub, choose a place based on the following criteria:

- Allow a clear view of the front panel LEDs and easy access to the ports.
- Avoid locations that are wet, dusty, or without ventilation.
- Avoid electromagnetically noisy areas, such as near power transformers or radio transmitters.
- Avoid temperatures below 32 degrees Fahrenheit or over 122 degrees Fahrenheit.

RACK INSTALLATION

Your switch comes with two rack mounting brackets. You can use these brackets to mount the switch on an EIA standard 19” rack. Attach the brackets to the switch, using the three short screws provided.



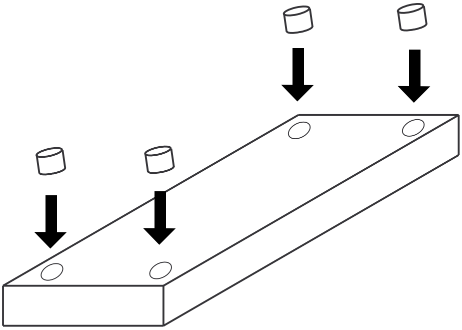
Attaching the mounting brackets for rack installation

Then install the switch in the rack, using the long screws provided to attach the brackets to the rack.

DESKTOP INSTALLATION

You may set the hub on a desk or countertop, or make a stack of hubs. For this type of installation, you will need rubber feet on the bottom of your hub to cushion against vibration. Some models come with the feet already attached, and some include self-adhesive feet separately.

If you need to install the feet, simply remove the protective sheet from each foot, and stick the feet to the four indented corners on the bottom surface of the hub.



Attaching self-adhesive feet to prepare for desktop installation

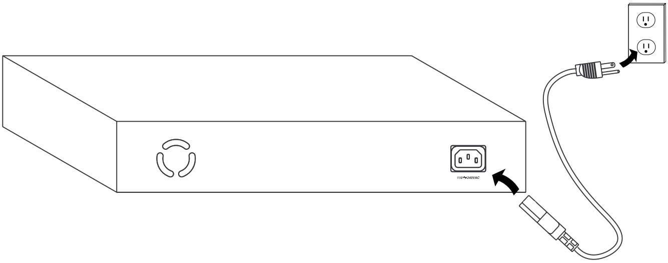
Caution: Do not place books, coffee cups, or other objects on top of your hub.

CONNECTING POWER TO YOUR HUB

The Fast Starlet Dual Speed Hub is equipped with a universal switching power supply that accepts AC input voltages from 100 to 240 VAC and 50 to 60 Hz.

To supply power to your hub:

1. Plug the connector of the power cord into the power port on the rear panel of your hub.
2. Plug the other end of the power cord into an AC wall outlet. Be sure that the outlet takes the three-pronged plug on the power cable.



Connecting the power cable to the Fast Starlet

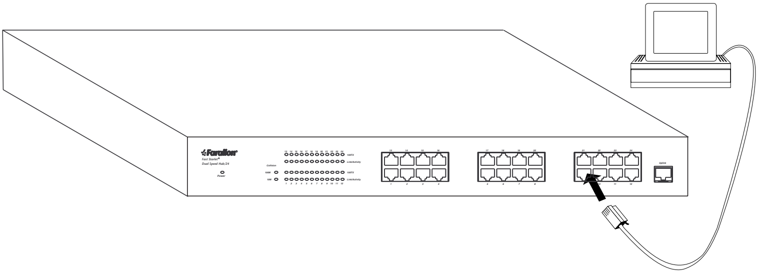
3. Verify that the Power LED is lit. If the power LED is not on, check to see that the power cord is properly connected. You can also verify that the outlet is functional by plugging in another device.

Note: Power must be on at all times for the network to continue running.

CONNECTING THE NUMBERED PORTS

Follow the steps below to connect computers, printers, or other network devices to your Fast Starlet Dual Speed Hub:

1. Verify that you have standard, straight-through UTP cable for connecting a computer or printer to your hub. You need Category 3 cable or higher for 10Base-T and Category 5 cable for 100Base-TX. Make sure that the length of the cable does not exceed 100 meters.
2. Connect one end of the cable to the Ethernet or Fast Ethernet port of the computer or printer that you want to add to the network. Verify that the device is on.
3. Connect the other end of the cable to your hub by inserting the RJ-45 connector into one of the ports. Be sure to use the numbered ports for connecting a computer or printer. (The port labelled “Uplink” is for connecting to other hubs.)



Connecting the numbered ports

4. Verify that the green Link LED is on for the port that you just connected. If the Link LED does not light up, check the following:
    - Verify that the computer or printer is on.
    - Verify that the computer or printer has an adapter card or is otherwise equipped for Ethernet/Fast Ethernet.
    - If the adapter card has a link status switch or jumper, verify that the switch or jumper is set to the correct position to support the network speed that you want (10Mbps or 100Mbps).
    - Verify that the cable between the computer and the hub is wired correctly. It must be a straight-through cable.

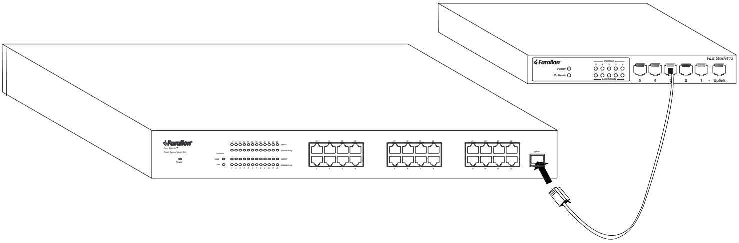
UPLINKING TO OTHER HUBS

Uplinks are connections to other hubs or to a network backbone. Your Fast Starlet Dual Speed Hub has two options for uplinking to other hubs—the Uplink port and the numbered ports.

- If you plan to use the Uplink port, be sure to use a standard, straight-through UTP cable to connect the Uplink port on the Fast Starlet to a regular port on the other hub. The Uplink port is designed so that a crossover cable is not necessary.

  Make sure that the length of the straight-through cable between the two hubs does not exceed 5 meters for a 100Base-TX connection or 100 meters for a 10Base-T connection.

  Note: The Uplink port and port 12 cannot be used at the same time. When the Uplink port is connected, port 12 is disabled. LED 12 applies to port 12 or to the Uplink port, whichever is in use.



Connecting the Uplink port

- If you plan to connect two hubs using one of the numbered ports, you must use a crossover cable. See Appendix B for more information about crossover cables.

ABOUT ADDRESS AGING

Your Fast Starlet Dual Speed Hub is designed to automatically recognize new devices and address changes on your network over time.

For immediate recognition of new addresses and changes to your network, we recommend that you repower your hub after making significant changes. This will allow your Fast Starlet Dual Speed Hub to discover all new addresses at once.

CHAPTER 3

Network Planning

With its 10/100Mbps auto-negotiating ports, your Fast Starlet Dual Speed Hub is like two hubs that are connected with a switch. This means that all Fast Starlet ports connected at 10Mbps are in a collision domain together, and all Fast Starlet ports connected at 100Mbps are in another collision domain together.

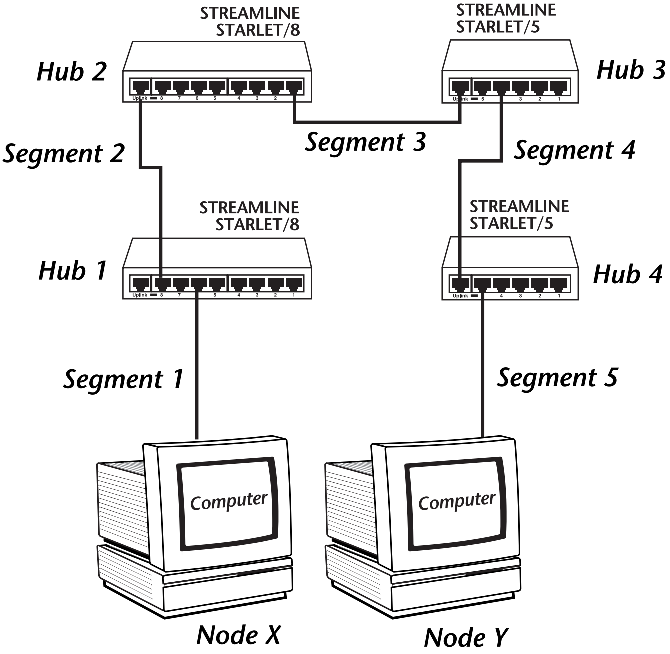
- For ports connected at 10Mbps, you must follow the 10Base-T guidelines below. Since the maximum number of hubs between two Ethernet nodes is four, this means that you may have only three additional hubs between any two nodes.
- For ports connected at 100Mbps, you must follow the 100Base-TX guidelines below. Since the maximum number of hubs between two Fast Ethernet nodes is two, this means that you may have only one additional hub between any two nodes.

10BASE-T ETHERNET GUIDELINES

These guidelines apply to 10Base-T Ethernet:

- The maximum length of a 10Base-T segment from a hub to an end node is 100 meters (330 feet).
- The maximum cable length between two hubs is 100 meters (330 feet).
- The maximum number of nodes on a 10Base-T segment is one. (**Note:** With Farallon EtherWave®, you can connect as many as seven nodes to a hub port in an EtherWave 10Base-T daisy chain.)
- Two-pair EIA/TIA Category 3 (NEMA standard) or higher UTP cable may be used. For convenience and easy upgrade, Farallon recommends using 2-pair Category 5 UTP cable for both 10Mbps and 100Mbps.
- The maximum number of hubs or repeaters between any two nodes in the network is four.
- The maximum number of segments between any two nodes in the network is five.
- The maximum network diameter is 500 meters (1640 feet).

The diagram below shows a network where the distance between Node X and Node Y is five segments and four hubs, the limit for Ethernet networks.



Maximum number of segments and hubs for 10Base-T Ethernet

100BASE-TX FAST ETHERNET GUIDELINES

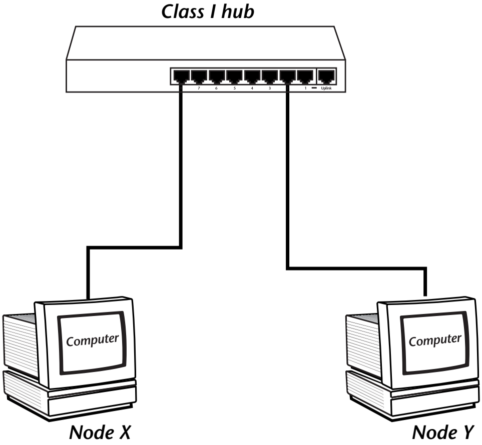
- The maximum length of a 100Base-TX cable segment from a hub to an end node is 100 meters (330 feet).
- The maximum cable length between two hubs is 5 meters (16.5 feet).
- The maximum number of end nodes on a 100Base-TX cable segment is one.
- The required cable type is EIA/TIA Category 5 UTP.
- The maximum number of hubs on a 100Base-TX segment is one if using Class I hubs and two if using Class II hubs.
- The maximum network diameter is 200 meters (656 feet) when using Class I hubs and 205 meters (672.5 feet) when using Class II hubs. All of Farallon's Fast Starlet hubs are Class II hubs.

100BASE-TX HUB CLASSIFICATIONS

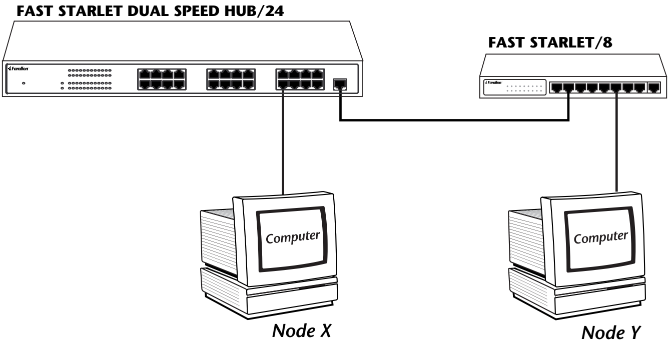
The 100Base-TX specification supports two different classifications of hubs, Class I and Class II.

- A 100Base-TX network using Class I hubs does not allow more than one hub (repeater) between two end node devices. If more than one Class I hub is installed on a network, then a bridge, router, or switch is required between each of the hubs.
- A 100Base-TX network using Class II hubs allows two hubs to be interconnected directly without the need for a bridge, router, or switch. If there are more than two Class II hubs installed on a network, then a bridge, router, or switch is required between every two sets of hubs. All of Farallon's Fast Starlet hubs are Class II hubs.

The diagrams below show networks using Class I and Class II hubs.



Class I hub on a 100Base-TX Fast Ethernet network



Class II hubs on a 100Base-TX Fast Ethernet network

DR. FARALLON CAN HELP YOUR NETWORK

Dr. Farallon's FREE Technical Support is available to help you with:

- networking your computers
- planning for network growth
- optimizing your current network

Call (510) 346-8001, or visit www.farallon.com.

We encourage you to register your Farallon product immediately for easy access to Dr. Farallon's FREE Technical Support.

APPENDIX A

Technical Specifications

COMPATIBILITY WITH ETHERNET STANDARDS

The Fast Starlet Dual Speed Hub has been designed in accordance with the IEEE Standard 802.3 for 10Base-T Ethernet and 802.3u for 100Base-TX Fast Ethernet.

POWER

100VAC–240VAC, 50Hz–60Hz

ENVIRONMENT

	Operating	**Storage**
Temperature	0˚C to 40˚C	–20˚C to 70˚C
Humidity	10% to 90% RH	5% to 90% RH

DIMENSIONS

430mm x 205mm x 44mm

REGULATORY NOTICES

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commerical environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residental area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This digital appartus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

CE MARK

This equipment conforms to the European Community CE Mark standard for the design and manufacturing of information technology equipment. This standard covers a broad area of product design, including RF emissions and immunity from electrical disturbances.

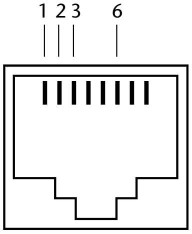
Warning: In a domestic environment this equipment may cause radio interference, in which case the user may be required to take adequate measures. Adequate measures include increasing the physical distance between this product and other electrical devices.

Appendix B

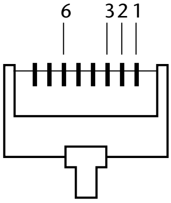
Cabling Information

This appendix provides the cabling specifications required to connect devices to your Fast Starlet Dual Speed Hub. You can use the specifications in this appendix to order the proper cable or create your own cable.

You need to use straight-through, unshielded twisted-pair cable to connect a non-repeating device to your Fast Starlet Dual Speed Hub. The illustration below shows the pins that are used for this connection.



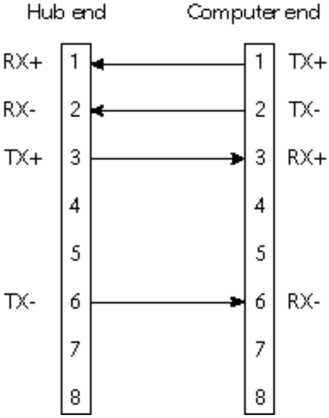
RJ-45 jack



RJ-45 plug

Pins 1, 2, 3, and 6 are used for 10Base-T and 100Base-TX twisted-pair wiring. Pins 1 and 2 must be a twisted pair, and pins 3 and 6 must be a twisted pair.

The illustration below shows the proper pin connections and identifies which pins are used to receive and transmit data.

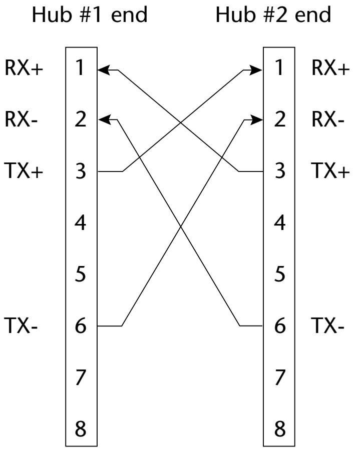


Straight-through cable (RX = receive, TX = transmit)

If the cable you are using has four twisted pairs, the two wire pairs, 4/5 and 7/8, must be crimped into the RJ-45 connector. The unused wire pairs must be terminated.

CROSSOVER CABLE

The illustration below shows the proper pin connections for crossover cable and identifies which pins are used to receive and transmit data. Pins 1 and 2 must be a twisted pair, and pins 3 and 6 must be a twisted pair.



Crossover cable (RX = receive, TX = transmit)

Use a crossover cable when connecting two hubs through their straight-through ports. Use a straight-through cable when connecting two hubs using the Uplink port on one of the hubs.

FARALLON TECHNICAL SUPPORT

Farallon is committed to providing its customers with reliable products and excellent technical support. Please take a moment now to fill out the registration card enclosed in your Farallon Fast Starlet package so that we can notify you about any updated product information.

Before contacting Farallon Customer Service, please look in this user’s guide for answers to your questions and possible solutions to a problem. Also, be sure to read any paper release notes or electronic “Read Me” files that you receive from Farallon.

If you contact us by telephone, please be at the site of the problem, prepared to reproduce it and to try some troubleshooting steps.

HOW TO REACH US

If you have any questions, concerns, or suggestions, please contact us by telephone, fax, mail, or via the Internet:

Phone: (510) 346-8001
(Phone support hours are 7:00 am to 4:30 pm PST.)

Fax: (510) 346-8116

Mail: Farallon Customer Service
3089 Teagarden St.
San Leandro, California 94577-5720
U.S.A.

Internet: info@farallon.com

FARALLON INTERNET INFORMATION RESOURCES

Please visit our website at www.farallon.com for Farallon product information, support resources and home networking information.

OUTSIDE OF THE UNITED STATES AND CANADA

If you are not located in the United States or Canada, you can get service locally by contacting your nearest Farallon reseller or distributor. For a worldwide list of our distributors, see our Internet information resources or contact Farallon directly.

WARRANTY

Farallon warrants to you, the end user, that the accompanying Farallon product, which may include third party products or technology (the “Product”) will be free from defects in materials and workmanship under normal use for the lifetime of the product. Farallon’s entire liability and your sole remedy under this warranty during the warranty period is that Farallon shall, at its option, either repair the Product or refund the original purchase price of the Product.

In order to make a claim under this warranty you must comply with the following procedure:

1. Contact Farallon Customer Service within the warranty period to obtain a Return Materials Authorization (“RMA”) number.

2. Return the defective Product and proof of purchase, shipping prepaid, to Farallon with the RMA number prominently displayed on the outside of the package.

If you are located outside of the United States or Canada, please contact your dealer in order to arrange for warranty service.

THE ABOVE WARRANTIES ARE MADE BY FARALLON ALONE, AND THEY ARE THE ONLY WARRANTIES MADE BY ANYONE REGARDING THE ENCLOSED PRODUCT. FARALLON AND ITS LICENSOR(S) MAKE NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, REGARDING THE ENCLOSED PRODUCT. EXCEPT AS OTHERWISE EXPRESSLY PROVIDED ABOVE, FARALLON AND ITS LICENSOR(S) DO NOT WARRANT, GUARANTEE OR MAKE ANY REPRESENTATION REGARDING THE USE OR THE RESULTS OF THE USE OF THE PRODUCT IN TERMS OF ITS CORRECTNESS, ACCURACY, RELIABILITY, CURRENTNESS, OR OTHERWISE. THE ENTIRE RISK AS TO THE RESULTS AND PERFORMANCE OF THE PRODUCT IS ASSUMED BY YOU. THE EXCLUSION OF IMPLIED WARRANTIES IS NOT PERMITTED BY SOME STATES OR JURISDICTIONS, SO THE ABOVE EXCLUSION MAY NOT APPLY TO YOU. IN THAT CASE, ANY IMPLIED WARRANTIES ARE LIMITED IN DURATION TO NINETY (90) DAYS FROM THE DATE OF DELIVERY OF THE PRODUCT. THERE MAY BE OTHER RIGHTS THAT YOU MAY HAVE WHICH VARY FROM JURISDICTION TO JURISDICTION.

REGARDLESS OF WHETHER OR NOT ANY REMEDY SET FORTH HEREIN FAILS OF ITS ESSENTIAL PURPOSE, IN NO EVENT WILL FARALLON, ITS LICENSOR(S) AND THE DIRECTORS, OFFICERS, EMPLOYEES OR AGENTS OF ANY OF THEM BE LIABLE TO YOU FOR ANY CONSEQUENTIAL, INCIDENTAL OR INDIRECT DAMAGES (INCLUDING DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, AND THE LIKE) ARISING OUT THE USE OR INABILITY TO USE THE PRODUCT EVEN IF FARALLON OR ITS LICENSOR(S) HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. BECAUSE SOME STATES OR JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU. FARALLON AND ITS LICENSOR(S) LIABILITY TO YOU FOR ACTUAL DAMAGES FROM ANY CAUSE WHATSOEVER, AND REGARDLESS OF THE FORM OF THE ACTION (WHETHER IN CONTRACT, TORT [INCLUDING NEGLIGENCE], PRODUCT LIABILITY OR OTHERWISE), WILL BE LIMITED TO $50.